



REMARKS

Claims 1, 2 and 4-10 are pending in the present application. Claims 1 and 6-10 are withdrawn from consideration. Claims 2, 4 and 5 are rejected. Claim 2 is objected to. Claim 2 is herein amended. Attached hereto is a marked-up version of the changes made to the by the current amendment. The attached page is captioned "Version with Markings to Show Changes Made."

Objections to the Claims:

Claim 2 is objected to because at the last line, it is suggested to delete the redundancy in reciting "an atom manganese Mn" to either the element or its elemental symbol.

Applicants also noted other similar grounds for objection in the claim, including "aluminum Al", "copper Cu", "nickel Ni" and "cobalt Co". Applicants include these corrections in the presently amended claim.

Rejections under 35 U.S.C. §112, second paragraph:

Claims 2, 4 and 5 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention.

Claim 2 recites the limitation "heat-treating and sintering the particles" in lines 14-15.

Applicants herein adopt the Examiner's suggestion of changing "heat-treating and sintering" to "heat-treating by sintering".

Claim 2 recites the limitation “the hydrogen absorbing alloy having a sintered surface region and a bulk region covered with the surface region” in lines 19-21.

Applicants herein adopt the Examiner’s suggestion of inserting “, the hydrogen absorbing alloy” after “the hydrogen absorbing alloy”.

Claim 2 recites the limitation “the first step” in line 3, the limitation “the second step” in line 12 and the limitation “the third step” in line 14. There is insufficient antecedent basis for each of these limitations in the claim.

Applicants herein change in each claim “the” to “a”, which cures the antecedent rejection.

Claim 2 recites the limitation “the respective abundance ratios” in line 22 and line 24 (both instances). There is insufficient antecedent basis for this limitation in the claim.

Applicants herein delete the “the” in each incidence.

Rejections under 35 U.S.C. §103(a)

Claims 2, 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over WO97/50135 to Ise et al. in view of U.S. Patent No. 5,932,372 to Rendina. The examiner relies on U.S. Patent 6,255,018, which is an equivalent to WO97/50135.

The Examiner notes that while Ise does not explicitly teach a third step of sintering, Rendina teaches that a heat-treatment step such as sintering is desired in order to enhance the binding of the various components of a composite to each other, as found in column 12, lines 42-45. Therefore, the Examiner concludes that it would have been obvious to modify Ise’s invention by employing a

sintering step.

Applicants respectfully disagree with the rejection, and provide the following comments.

Applicants note that Ise et al. discloses treating the particles of hydrogen absorbing alloy in

clearly delineated in rejection relied on

an acid solution. However, Ise et al. does not show a third step of heat-treating by sintering the particles of the hydrogen absorbing alloy treated in the acid solution at a temperature of not more than the melting point of the particles of the hydrogen absorbing alloy in a hydrogen atmosphere shown in claim 2 of the present invention. As a result, Applicant submit that the effect shown from page 11, line 3 to page 12, line 8 is not attained by the invention of Ise et al. In other words, the effect that an oxide on the surface of each of the particles of the hydrogen absorbing alloy is reduced by sintering, Mn contained in the hydrogen absorbing alloy is moved to the surface of the particle of the hydrogen absorbing alloy, and Ni and Co are prevented from being oxidized again by Mn as shown in the present invention, are not attained by the invention of Ise et al. Therefore, one would not look to Ise et al. for motivation or suggestion to attain the present invention.

not in claim

As to Rendina

As to Rendina, Applicants agree that Rendina teaches that sintering is desired in order to enhance the binding of the various components of a composite to each other. However, Rendina does not show heat-treating the particles of the hydrogen absorbing alloy in a hydrogen atmosphere as shown in the present invention. Therefore, Rendina does not teach or suggest that an oxide on the surface of each of the particles of the hydrogen absorbing alloy treated in the acid solution is reduced, Mn contained in the hydrogen absorbing alloy is moved to the surface of the particle of the hydrogen absorbing alloy, and Ni and Co are prevented from being oxidized again by Mn.

Amendment under 37 C.F.R. 1.111
Teruhiko IMOTO et al.

U.S. Patent Application Serial No. 09/701,512
Attorney Docket No. 001431

For at least the above reasons, Applicants submit that the present claims, as herein amended, are patentable over the rejections. Withdrawal of the rejections is earnestly requested.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees that may be due with respect to this paper to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Version with markings to show changes made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Serial No. 09/701,512

THE CLAIMS:

Please amend claim 2 as follows:

2. (Amended) A method of producing a hydrogen absorbing alloy for an alkaline storage battery, characterized in that ~~the~~ a first step of obtaining particles of a hydrogen absorbing alloy having a crystal structure of a CaCu_5 type and represented by a composition formula $\text{MmNi}_x\text{Co}_y\text{Mn}_z\text{M}_{1-z}$ (in the formula, M is at least one element selected from aluminum ~~Al~~ and copper ~~Cu~~, x is a composition ratio of nickel ~~Ni~~ and satisfies $3.0 \leq x \leq 5.2$, y is a composition ratio of cobalt ~~Co~~ and satisfies $0 \leq y \leq 1.2$, and z is a composition ratio of manganese ~~Mn~~ and satisfies $0.1 \leq z \leq 0.9$, with the proviso that the sum of x, y, and z satisfies $4.4 \leq x + y + z \leq 5.4$), ~~the~~ a second step of treating said particles of the hydrogen absorbing alloy in an acid solution, and ~~the~~ a third step of heat-treating ~~and by~~ sintering the particles of the hydrogen absorbing alloy treated in the acid solution at a temperature of not more than the melting point of the particles of the hydrogen absorbing alloy in a hydrogen atmosphere are carried out, to produce the hydrogen absorbing alloy, the hydrogen absorbing alloy having a sintered surface region and a bulk region covered with the surface region and satisfying the condition of $a/b \geq 1.21$, ~~letting wherein a be~~ is the sum of ~~the~~ respective abundance ratios of atoms Ni, Co, and Mn in the surface region and ~~letting wherein b be~~ is the sum of ~~the~~ respective abundance ratios of atoms Ni, Co, and Mn and the surface region having an atom manganese ~~Mn~~.

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